

Annex D

TRANSMITTER TUNE UP PROCEDURE

RULE PART NUMBER: 2.1033 c (9)

Exciter Module (T881-xx-0200) (Excerpts from the technical manual pages 30-35)

Note 1: Refer to Figure 1 (T881).

Note 2: When the synthesizer is unlocked, the front panel green LED called "Supply" will flash indicating that it needs re-tuning.

Warning:

The LED will also flash when the unit is in setup mode while connected to the PGM800win program.

Initial Setup

1. Shut down power to the base station.
2. Prepare the Multimeter to DC Volts.
3. Remove the exciter (T881) module from the base station rack frame.
4. Remove the exciter top cover (nearest the handle).
5. Connect a 3 feet long double shielded cable (N-M to BNC-M) between the IFR T/R output and the exciter antenna connector.
6. Connect the Paragon-III Extender Rail Kit to the empty chassis exciter slot.
7. Apply power to the base station.

Synthesizer Alignment

Single channel: Connect the Multimeter to either side of L309 (T881).

- T881 (700 MHz) Tune VCO trimmer CV300 for a synthesizer loop voltage of 10V DC.

Multiple channels (adjusting as shown for single channel above):

- T881 (700 MHz) Adjust the VCO loop to 10V using the middle frequency channel.

All channels should lie within the upper and lower limits of 16V and 3V respectively for the T881.

Note:

Normally, the fast TX key option is installed and the synthesizer is always energized. In the case where that option was not fitted, key the transmitter by pressing the front panel Carrier button to make the above adjustment possible.

TX Frequency Error Adjustment

1. Apply the following settings to the IFR:
 - Receiver mode
 - IFR RX frequency to match the main radio TX frequency
 - IF Filter set to 30KHz
 - Zoom the RF Error window: select 10Khz range

2. Key the transmitter by pressing the front panel TX-Key button and measure the carrier output frequency. It should be within ± 300 Hz. If it is not, adjust the TCXO (IC700) to trim to meet the requirement, preferably within 100Hz.

Low-Frequency Balance Adjustment

Note:

- *PGM800Win version 3.00 or later must be used. Electronic potentiometer (256 step) is used to allow channel adjustment of two-point modulation (Low freq. balance).*

1. Apply the following settings to the IFR:
 - Receiver mode and Oscilloscope display (Source Demod out connector, DC coupled).
 - IFR RX frequency to match the radio transmit frequency
 - IF Filter set to 30KHz
 - Zoom the Deviation window: select 10kHz Range and DC coupling.
2. Select the active or, the lowest (in the case of multi-channel base) frequency channel (via dip switch)
3. Transmit a square wave by using CDip (using a second serial port).
4. Press EPOTs button. Adjust IC220 via PGM800Win “reference modulation” to obtain the best square wave, no damping, no overshoot. (You can use either the mouse or up and down arrow keys). Record the deviation read.
5. For single-channel unit, proceed to step 8.
6. For multi-channel unit, select the highest frequency channel. Transmit a square wave from Dataradio’s test software. Record deviation again.
7. The difference in deviation between the two channels should be less than ± 300 Hz. If not, re-adjust IC220 to “average” the square wave shape on both channels until the spec is met.
8. To confirm the adjustment, select the active, or the lowest frequency channel. Compare the deviation produced between 1000 Hz sine wave test tone and Random data test pattern
The difference between the test tone and the test pattern should be less than
1.9 kHz for (xRC16FSK)
For multi-channel unit, repeat this step on the highest frequency channel.
9. Select the active channel. Transmit a TX ON (Modulated) adjustment tone via CDip. Make sure that deviation levels read on the IFR correspond to 8kHz+5/-10%. Re-adjust deviation as necessary.

Exciter Power Output

1. Apply the following settings to the IFR:
 - Receiver mode, Output T/R
 - IFR RX frequency to match the main radio TX frequency
 - IF Filter set to 30KHz
 - Select auto range in the *Power reading* window
 - Connect the coaxial cable from the IFR T/R to the Exciter output connector
2. Key the Exciter by pressing the module PTT button. The output power at the coaxial cable end connecting to the power amplifier should be:
 - T881 = 5W +0/-300mW (RV502, Figure 1) or the required output power in the range 1W-5W



Figure 1 - T881-0200 Exciter Tuning Controls locationignal before it reaches the T881 exciter.